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ABSTRACT

This paper reports on the New Jersey State Department of Education's research process for developing a scoring rubric that assesses test objectives and higher order thinking skills through writing. New Jersey's statewide assessment program includes a written essay portion to test students' ability to write on a given topic and communicate an intended message to a specific audience. Prior to its implementation as a graduation requirement, the Department of Education administered the essay test for two years to all ninth-grade students attending New Jersey's public schools. The essay test consists of five minutes for prewriting and five minutes for revision within the 30 minutes allotted for the writing sample. Research was conducted to determine a consistent scoring procedure that is most appropriate for assessing the ability to think logically and critically--skills that are included in objectives of the statewide testing program. Registered Holistic Scoring, a newly developed scoring method, is based upon students' level of facility with: (1) organization/content; (2) usage; (3) sentence construction; and (4) mechanics. Data was collected from the chief readers who scored the essays. An analysis was conducted to identify common elements. Based on the research, a scoring rubric and training program was developed. Additional characteristics that distinguish the Registered Holistic Scoring method from other scoring methods are described. (Author/PN)

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ASSESSING HIGHER ORDER THINKING SKILLS THROUGH WRITING

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ABSTRACT

New Jersey's statewide assessment program includes a written essay portion to test students' ability to write on a given topic and communicate an intended message to a specific audience. Prior to its implementation as a graduation requirement, the Department of Education administered the essay test for two years to all ninth-grade students attending New Jersey's public schools. Research was conducted to determine a consistent scoring procedure that is most appropriate for assessing the ability to think logically and critically -- skills that are included in objectives of the statewide testing program. Data was collected from the chief readers who scored the essays. An analysis was conducted to identify common elements. Based on the research, a scoring rubric and training program was developed.

The objectives of this paper is to report on the research process for developing a scoring rubric that assesses test objectives and higher order thinking skills through writing.

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Background: From Holistic to Registered Holistic Scoring

During the 1982-83 school year, the New Jersey State Department of Education began to annually examine students' ability to write during their ninth grade school year as part of the statewide testing program. The examination consists of multiple-choice questions which test the three skill areas -- sentence structure, organization of ideas, editing -- and a written essay. The written essay tests students' ability to write on a given topic and communicate an intended message to a specified audience. The essay test consists of five minutes for prewriting and five minutes for revision within the 30 minutes allotted for the writing sample. (At the time of testing students are given an essay topic sheet, space for notetaking, as well as a writing checklist.)

The scoring of the essay had been conducted using the Holistic scoring method, a procedure pioneered by the Educational Testing Service (ETS). This scoring method is being used by approximately 15 states. New Jersey adopted the procedure, initially, because it was an effective and efficient scoring method for rating large numbers of essays.

Features of the Holistic scoring method include:

- The scoring of students' writing based on each student's entire sample of written communication and the overall impression of the quality of that writing in relationship to the total population of student writers. Two readers independently score each essay using numerical points on a score scale. Score scales can have points that range from 1 to 6 (1 lowest, 6 highest writing ability) as well as 1 to 4, 1 to 8, etc.

- The measuring and reporting of students' writing ability as a score that is considered relative to that of the given population of students who wrote essays on the same topic.

- Looking at what is good in students' writing and if a given paper is comparable to the anchor sets (actual student essays which are determined to be representative of the points along the score scale and are part of training).

- A minimal amount of training (one-half a day, using a 6-point scale) since anchor sets, actual student essays at each score point, are used by trainers to achieve reader consensus.

- Rapid reader response, since scorers are reading for an "overall impression" of the students' written communication, not for any specified feature(s), e.g., organization, content, style, and punctuation.

After two years of experience with the Holistic scoring method, the department determined that this method was not sufficient because the writing examination will become part of our high school graduation requirement. As part of this requirement, the department must ensure that the quality of writing represented by each score point is equivalent from year to year. For example, regardless of when a student takes the test and the topic upon which he/she writes, a score of 4 or 3, etc. must always indicate the same level of writing. After a review of other scoring methodologies and inquiry into other states' efforts, the department began to modify Holistic scoring, and developed a method called Registered Holistic Scoring.

The Registered Holistic scoring method is based on defined features of writing quality and levels of writing proficiency, while other scoring methods (e.g., holistic, analytic, primary trait) vary with the nature of the writing to be scored (e.g., narrative, descriptive, etc.) relative to the local instructional objectives under evaluation. The Registered Holistic scoring method judges students according to their proficiency or level of command of written language and their success in producing a writing sample. Proficiency and success are based upon students' command or level of facility with four features: 1) organization/content, 2) usage, 3) sentence construction and 4) mechanics as salient features of written expression resulting in an essay that communicates an intended message to a given audience.

It is the predetermined set of features in Registered Holistic scoring, (i.e., organization/content, usage, sentence construction and mechanics) that is registered or anchored by statement(s) that creates the scoring guide criteria. The point values (score points) that describe the command of language or proficiency level that the point represents are defined by how well the four features are handled. New Jersey uses a six-point score scale: 1 (lowest) to 6 (highest). In other words, the Registered Holistic scoring method judges students' writing proficiency by the use of predetermined essay qualities (features) that readers attribute to the success or lack of success of a given writing sample. The essay qualities are descriptive criteria registered at each score point and considered by experts as most important to a written response that communicates an intended message to an intended audience for a given purpose (Breland and Jones, 1984; Freedman, 1979).

Source of the Data

New Jersey established the registered holistic features of its scoring criteria by collecting data in the form of narrative reports from the chief readers who had been conducting the holistic scoring sessions from 1982 through 1984. At the conclusion of each scoring session, the department asked each chief reader to independently identify those features considered inherent to written essays at each of the 1 to 6 score points. A comparison study of these reports was then conducted to determined whether a common set of elements existed as features within the score points. The results of the study were used to establish "predetermined" features that would be placed along the 1 to 6 score scale and, when established and reinforced through training prior to having scorers score actual essays, could help maintain reader reliability when assigning scores. Thus, the predetermined criteria

(the four features at each of the six score points), when annually registered or consistently applied, can assist in the comparison of students' writing ability from one year to the next. (See the Appendix for additional information and specific sources.)

Characteristics of the Registered Holistic Scoring Method

Besides the features presented above, the Registered Holistic scoring method has additional characteristics that distinguish it from other scoring methods.

- The Registered Holistic scoring method anchors consistent features of writing independent of topic and mode from year to year. This is necessary given the statewide test that occurs annually with a yearly change in both topic and student population. In other words, to assure score point consistency from one year to the next (same level of student writing) the scoring method focuses on features of good writing. Although a topic can elicit a variety of responses written in a variety of modes (narrative, persuasive, etc.), a composition's rating is based on the student's facility with the four features. In turn, that facility is registered by a point on the score scale that describes the student's command of written language.

- Since the established criteria allow the anchoring of consistent features from year to year (i.e., organization/content, usage, sentence construction and mechanics) it eliminates the relative scoring procedures of Holistic scoring. That is, whereas a paper that received a 4 in one year could receive a 2 in the following year using the holistic method, a paper receiving a 4 one year using the Registered Holistic scoring method will always receive a 4.

- Since the criteria for the Registered Holistic scoring method are set forth at each of the six score points as four descriptive features, scorer reliability can be maintained. The descriptive statements of each feature at each score point (see appendix) represent the quality of written communication inherent in essays assigned that given score point and are necessary to indicate the students' command of written language.

- The Registered Holistic scoring method provides a distribution of essay scores that reflect not only student mastery of writing, but also the alignment of the districts' instructional programs that are linked to the criteria (features) that measure students' writing ability.

- The training and selection of reliable, accurate readers require a two-day training period. During this period, candidates qualify as readers by attaining 80 percent agreement on three of six essay training sets. (Each training set contains 10-15 student essays. The agreement rate must be perfect or adjacent to the established committee score points in order for an individual to qualify as reader.) Team leaders were expected to qualify with perfect

agreement. (The training papers used to establish a qualifying set have been independently read by a committee of six individuals: four score directors, one consultant, and one department staff member. The papers represent perfect agreement among the scorers as to the registered score point assigned each paper.)

- Reader bias (a personal preference for scoring based on mechanical errors, form/number of paragraphs, flavor or style, etc. to the elimination of other features) is diminished because the criteria are established prior to the actual scoring of students' essays. In addition, the criteria are essential factors within the qualifying and training sets that are used to select reliable readers who can consistently and reliably apply the scoring criteria of the score scale.

- The criteria permit reporting/interpretive information regarding students' stengths and needs when writing on demand in a timed setting. Of benefit to educators is the indication of the effectiveness of the instructional programs and strategies that are based on the features considered important to all good writing.

The Registered Holistic scoring method gives us capabilities beyond the Holistic scoring method that impacts on instruction and cognitive development. Those capabilities not only influence the programmatic aspects of schooling but also the developmental, cognitive aspects of learning. The capabilities of the Registered Holistic Scoring method include:

- Information on students' strengths and needs in organization/content, sentence construction, usage and mechanics of writing.

- Information to local school district personnel about the effectiveness of the instructional program as it reflects students' mastery in writing and predetermined skill areas measured from year to year on the essay. The results are not relative to the given population of students tested and based on an "overall impression" of students' writing ability, but rather the results are descriptive of the features established along the six score points and are indicative of students' command of written language at a given moment in time.

- Maintenance of scorer accuracy. Readers participate in two days of intensive training as well as the rigors of qualifying at 80 percent perfect or adjacent agreement on at least three of six qualifying sets of student essays. (The 10-15 papers within a qualifying set have been independently read by a committee of six or more individuals with perfect agreement among the scorers as to the registered score point assigned each paper.)

- Score reliability or score-point remains consistent from year to year because the criteria (the four features at each score point) do not change. The topic will change and the student responses will change, but the criteria are registered to the features of good writing independent of topic and mode, that is, organization/ content, usage, sentence construction and mechanics.

- The emphasis of writing as a higher-order thinking skill as measured by the HSPT. Writing requires knowledge of one's topic (content); a cogent application of that knowledge (organization); use of the English language according to a recognized standard (usage); the structuring of words and sentences to present a complete thought or message to the intended audience(s) (sentence construction); and the application of the conventions of the English language that serve to clarify the author's intended message (mechanics).

Writing As A Higher Order Thinking Skill

MANY RESEARCHERS VIEW WRITING NOT ONLY AS A MEDIUM OF THOUGHT BUT ALSO AS A VEHICLE FOR DEVELOPING IT. SOME TYPES OF ELABORATED THINKING ARE NOT POSSIBLE UNLESS THE PROPOSITIONS ARE WRITTEN DOWN. BOTH THE ACTS OF COMPREHENDING AND COMPOSING THOUGHTS REQUIRE HIGHER LEVEL THINKING SKILLS.

As mentioned earlier the basic premise of this paper is the relationship of writing to higher order thinking skills. If we look at Bloom's taxonomy of cognitive skills and relate those skills to writing we will see the following relationship exist between the cognitive objectives and the writing task.

Bloom's taxonomy in ascending order of complexity, sophistication and difficulty is as follows:

COGNITIVE OBJECTIVES	RELATED WRITING TASK
Knowledge	Recall/remember/associate previously learned knowledge to the essay topic or prompt.
Comprehension	Translate/grasp/understand/clarify the meanings associated with prior knowledge and address that meaning to explain or focus on the given topic.
Application	Generalize/associate prior knowledge (content) to new and concrete situations related to the given topic, message, and audience.
Analysis	Breakdown/discover/distill/compare and contrast prior knowledge (content) in order to organize or reorganize that knowledge into its component parts (main idea, supporting details) for ease of understanding by the reader. Moffet (1968) calls this skill "precise-processing."

Synthesis	Compose or put knowledge together to form a new whole employing focus, content, organization and language construction (syntax and lexical) to help the reader progress from beginning to end. A skill characterized as the act of cohesion - the essential quality which makes a text a text. (Haliday & Hassan, 1976).
Evaluation	Judge the value of the written essay or artifact on the topic given for the message, purpose, and the audience intended.

In conclusion, writing is viewed by many researchers as not only a medium of thought but also a vehicle for developing it. As people think they actively engage their minds to discover and contemplate ideas, issues, or problems they care about and can relate to a given topic, as in the case of a test taker. According to Tipper (1985) "when the writer wrestles with ideas, meanings and words, that is what thinking is made of, what poetry, philosophy, criticism, and invention are born of."

Thus, proficient writing is a disciplined activity requiring an ability to express thoughts clearly as well as coherently. It requires planning and working toward a goal, the decomposition of a task into component subtasks and the integration of partial products into a coherent whole. With respect to teaching and assessment, the major advantage of writing is that it yields a tangible product that can be reexamined and evaluated. A writer puts his/her mind out before the reader not unlike a photograph. However, as students quickly perceive, the reader of that writing must make meaning of the written text in order to enjoin the reader and the writer in a shared experience. Student-writers need to be taught and informed as to what is essential to the command of written language. A student who can translate thought into writing, take hold of a writing topic, create an original response under the constraints of writing on demand -- what better evidence of real thinking? -- What better way to assess higher order thinking skills?

The scoring method does not rely on raters to infer or overlay the criteria/feature from examples or anchor papers. Rather, the method relies on the consistent and defined criteria at each score point. Samples and accompanying anecdotes included in this paper show how well students are able to command or handle the four features of written language. All discussion during training uses the language of the scoring guide to assure that the raters' application of the Registered Holistic scoring method is accurate and consistent.

Broad definitions of the four features are presented below as an overview. However, raters must internalize feature specifics for each score point.

ORGANIZATION/ CONTENT

- refers to the writer's ability to set forth thoughts and related ideas for an intended audience that are both logically arranged and communicative on a given topic. This feature is the first and, therefore, most important feature raters are asked to focus upon and judge. (See each score point for explicit definitions.)

USAGE

- refers to the use of tense formation, subject-verb agreement, pronoun usage and agreement, and word choice.

SENTENCE CONSTRUCTION

- refers to the ways in which words are put together to form phrases, clauses, and sentences that are grammatically and/or rhetorically correct; varied; coherent and intelligible.

MECHANICS

- refers to the conventions of standard edited English including spelling, punctuation, and capitalization.

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